**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (currently amended): A digital baseband (DBB) transmitter comprising:

(a) an analog radio transmitter including a temperature sensor;

(b) a plurality of digital compensation modules;

(c) a memory for storing a plurality of look up tables (LUTs) ~~at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter~~; and

(d) at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter, the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor.

2. (currently amended): The DBB transmitter of claim 1 wherein the analog radio transmitter further comprises:

(i) a power amplifier;

(ii) a modulator; and

(iii) a power detector.

Claim 3 (canceled)

4. (currently amended): The DBB transmitter of claim 1 ~~claim 2~~ wherein the analog radio transmitter further comprises a bias current sensor for monitoring a bias current reading associated with the analog radio transmitter, and at least one of the digital compensation modules is activated in response to the bias current sensor.

Claim 5 (canceled)

6. (currently amended): The DBB transmitter of claim 1 ~~claim 5~~ wherein the digital compensation modules include a digital pre-distortion compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the power amplifier is prone to a linearity deficiency, and the digital pre-distortion compensation module is configured to distort the phase and amplitude of the I and Q signal components based on gain and phase characteristics of the power amplifier stored in the selected LUT, such that the power amplifier generates a linear response rather than a distorted response.

7. (currently amended): The DBB transmitter of claim 1 wherein the digital compensation modules include a digital pre-distortion compensation module having two signal inputs including an in-phase (I) input and a quadrature (Q) input, the DBB transmitter further comprising:

(e) a low pass filter (LPF) coupled to each of the I and Q inputs of the digital pre-distortion compensation module; and

(f) at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter.

8. (original): The DBB transmitter of claim 7 wherein each LPF is a root-raised cosine (RRC) filter.

9. (original): The DBB transmitter of claim 1 wherein the digital compensation modules include a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to a carrier leakage deficiency, a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values.

10. (original): The DBB transmitter of claim 9 wherein the modulator has a local oscillator (LO) frequency at which the minimum detected readings are determined.

11. (original): The DBB transmitter of claim 1 wherein the digital compensation modules include a digital amplitude imbalance compensation module having two signal inputs including an in-phase (I) signal component and a

quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to an amplitude balance deficiency, and the digital amplitude imbalance compensation module is configured to adjust the power level of one of the I and Q signal components, such that the power level of each of the I and Q signal components is the same.

12. (original): The DBB transmitter of claim 1 wherein the digital compensation modules include a digital phase imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to a phase balance deficiency, and the digital phase imbalance compensation module is configured to adjust the phase of the I and Q signal components, such that the phase of each of the I and Q signal components are orthogonal to each other.

13. (currently amended): The DBB transmitter of claim 1 further comprising:

(e) a modem for generating in-phase (I) and quadrature (Q) signal components which are input to each of the digital compensation modules~~, the DAC~~ and the analog radio transmitter.

14. (currently amended): A wireless transmit/receive unit (WTRU) comprising:

(a) an analog radio transmitter <u>including a temperature sensor</u>;

(b) a plurality of digital compensation modules;

(c) a memory for storing a plurality of look up tables (LUTs) ~~at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter~~; and

(d) at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter, the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor.

15. (currently amended): The WTRU of claim 14 wherein the analog radio transmitter further comprises:

(i) a power amplifier;

(ii) a modulator; and

(iii) a power detector.

Claim 16 (canceled)

17. (currently amended): The WTRU of claim 14 ~~claim 15~~ wherein the analog radio transmitter further comprises a bias current sensor for monitoring a bias current reading associated with the analog radio transmitter, and at least one of the digital compensation modules is activated in response to the bias current sensor.

Claim 18 (canceled)

19. (currently amended): The WTRU of claim 14 ~~claim 18~~ wherein the digital compensation modules include a digital pre-distortion compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the power amplifier is prone to a linearity deficiency, and the digital pre-distortion compensation module is configured to distort the phase and amplitude of the I and Q signal components based on the gain and phase characteristics of the power amplifier stored in the selected LUT, such that the power amplifier generates a linear response rather than a distorted response.

20. (currently amended): The WTRU of claim 14 wherein the digital compensation modules include a digital pre-distortion compensation module having two signal inputs including an in-phase (I) input and a quadrature (Q) input, the WTRU further comprising:

(e) a low pass filter (LPF) coupled to each of the I and Q inputs of the digital pre-distortion compensation module; and

(f) at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter.

21. (original): The WTRU of claim 20 wherein each LPF is a root-raised cosine (RRC) filter.

22. (original): The WTRU of claim 14 wherein the digital compensation modules include a digital DC offset compensation module having two signal inputs

including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to a carrier leakage deficiency, a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values.

23. (original): The WTRU of claim 22 wherein the modulator has a local oscillator (LO) frequency at which the minimum detected readings are determined.

24. (original): The WTRU of claim 14 wherein the digital compensation modules include a digital amplitude imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to an amplitude balance deficiency, and the digital amplitude imbalance compensation module is configured to adjust the power level of one of the I and Q signal components, such that the power level of each of the I and Q signal components is the same.

25. (original): The WTRU of claim 14 wherein the digital compensation modules include a digital phase imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to a phase balance deficiency, and the digital phase imbalance compensation module is

configured to adjust the phase of the I and Q signal components, such that the phase of each of the I and Q signal components are orthogonal to each other.

26. (currently amended): The WTRU of claim 14 further comprising:

(e) a modem for generating in-phase (I) and quadrature (Q) signal components which are input to each of the digital compensation modules~~, the DAC~~ and the analog radio transmitter.

Claims 27-33 (canceled)

34. (currently amended): An integrated circuit (IC) for processing signals input to an analog radio transmitter including a temperature sensor, the IC comprising:

~~(a) a digital pre-distortion compensation module;~~

(a) ~~(b)~~ a plurality of digital compensation modules;

(b) a memory for storing a plurality of look up tables (LUTs) ~~(c) at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter~~; and

(c) ~~(d)~~ at least one controller in communication with the ~~analog radio transmitter and~~ each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter, the temperature sensor monitors a temperature reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the temperature reading monitored by the temperature sensor.

Claim 35 (canceled)

36. (currently amended): The IC of claim 34 ~~claim 35~~ wherein the digital compensation modules include a ~~the~~ digital pre-distortion compensation module having ~~has~~ two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, and the digital pre-distortion compensation module is configured to distort the phase and amplitude of the I and Q signal components based on information stored in the selected LUT, such that at least one RF characteristic of the analog radio transmitter is improved.

37. (currently amended): The IC of claim 34 wherein the digital compensation modules include a digital pre-distortion compensation module having two signal inputs including an in-phase (I) input and a quadrature (Q) input, the IC further comprising:

(d) ~~(c)~~ a low pass filter (LPF) coupled to each of the I and Q inputs of the digital pre-distortion compensation module; and

(e) at least one digital to analog converter (DAC) for interfacing the digital compensation modules with the analog radio transmitter.

38. (original): The IC of claim 37 wherein each LPF is a root-raised cosine (RRC) filter.

39. (original): The IC of claim 34 wherein the digital compensation modules include a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q)

signal component, the analog radio transmitter includes a modulator prone to a carrier leakage deficiency, a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values.

40. (original): The IC of claim 39 wherein the modulator has a local oscillator (LO) frequency at which the minimum detected readings are determined.

41. (original): The IC of claim 34 wherein the digital compensation modules include a digital amplitude imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter includes a modulator prone to an amplitude balance deficiency, and the digital amplitude imbalance compensation module is configured to adjust the power level of one of the I and Q signal components, such that the power level of each of the I and Q signal components is the same.

42. (original): The IC of claim 34 wherein the digital compensation modules include a digital phase imbalance compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, the analog radio transmitter including a modulator prone to a phase balance deficiency, and the digital phase imbalance compensation module is

configured to adjust the phase of the I and Q signal components, such that the phase of each of the I and Q signal components are orthogonal to each other.

43. (original): The IC of claim 34 further comprising:

(d) ~~(e)~~ a modem for generating in-phase (I) and quadrature (Q) signal components which are input to each of the digital compensation modules~~, the DAC and the analog radio transmitter~~.

44. (new): A digital baseband (DBB) transmitter comprising:

(a) an analog radio transmitter including a modulator prone to a carrier leakage deficiency; and

(b) a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, wherein a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values.

45. (new): The DBB transmitter of claim 44 wherein the modulator has a local oscillator (LO) frequency at which the minimum detected readings are determined.

46. (new): A wireless transmit/receive unit (WTRU) comprising:

(a) an analog radio transmitter including a modulator prone to a carrier leakage deficiency; and

(b) a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, wherein a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values.

47. (new): The WTRU of claim 46 wherein the modulator has a local oscillator (LO) frequency at which the minimum detected readings are determined.

48. (new): An integrated circuit (IC) for processing signals input to an analog radio transmitter including a modulator prone to a carrier leakage deficiency, the IC comprising:

(a) a digital direct current (DC) offset compensation module having two signal inputs including an in-phase (I) signal component and a quadrature (Q) signal component, wherein a minimum detected reading associated with each of the signal inputs is determined, first and second DC offset compensation values are determined based on the minimum detected readings, and the digital DC offset compensation module is configured to eliminate carrier leakage associated with the modulator by adjusting the respective DC levels of the two signal inputs based on the first and second DC offset compensation values; and

(b) at least one digital to analog converter (DAC) for interfacing the digital DC offset compensation module with the analog radio transmitter.

49. (new): The IC of claim 48 wherein the modulator has a local oscillator (LO) frequency at which the minimum detected readings are determined.

50. (new): A digital baseband (DBB) transmitter comprising:

(a) an analog radio transmitter including a bias current sensor;

(b) a plurality of digital compensation modules;

(c) a memory for storing a plurality of look up tables (LUTs); and

(d) at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter, the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor.

51. (new): The DBB transmitter of claim 50 wherein the analog radio transmitter further comprises:

(i) a power amplifier;

(ii) a modulator; and

(iii) a power detector.

52. (new): The DBB transmitter of claim 50 wherein the analog radio transmitter further comprises a temperature sensor for monitoring a temperature reading associated with the analog radio transmitter, and at least one of the digital compensation modules is activated in response to the temperature sensor.

53. (new): A wireless transmit/receive unit (WTRU) comprising:

(a) an analog radio transmitter including a bias current sensor;

(b) a plurality of digital compensation modules;

(c) a memory for storing a plurality of look up tables (LUTs); and

(d) at least one controller in communication with the analog radio transmitter and each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter, the bias current sensor monitors a bias current reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the bias current reading monitored by the bias current sensor.

54. (new): The WTRU of claim 53 wherein the analog radio transmitter further comprises:

(i) a power amplifier;

(ii) a modulator; and

(iii) a power detector.

55. (new): The WTRU of claim 53 wherein the analog radio transmitter further comprises a temperature sensor for monitoring a temperature reading

associated with the analog radio transmitter, and at least one of the digital compensation modules is activated in response to the temperature sensor.

56. (new): An integrated circuit (IC) for processing signals input to an analog radio transmitter including a bias current sensor, the IC comprising:

(a) a plurality of digital compensation modules;

(b) a memory for storing a plurality of look up tables (LUTs); and

(c) at least one controller in communication with each of the digital compensation modules, wherein the digital compensation modules correct radio frequency (RF) parameter deficiencies that occur in the analog radio transmitter, the current bias sensor monitors a current bias reading associated with the analog radio transmitter, and a particular one of the LUTs is selected from the memory to set up parameters for at least one of the digital compensation modules in response to the current bias reading monitored by the current bias sensor.